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09/310,256	05/12/1999	SHENG-CHI CHIN	TSMC98-574	8566

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GEORGE O. SAILE & ASSOCIATES
28 DAVIS AVENUE
POUGHKEEPSIE, NY 12603

EXAMINER	
AHMED, SHAMIM	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 17

Application Number: 09/310,256
Filing Date: May 12, 1999
Appellant(s): CHIN ET AL.

Stephen B. Ackerman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/24/02.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The amendment after final rejection filed on 10/29/01 has not been entered.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is substantially correct. The changes are as follows: Claims 16-22 is now indicating allowable.

Applicant's argument to claims 16-22 are persuasive and accordingly, the rejection to claims 16-22 is withdrawn.

The applied prior art does not teach a process of reducing particle count at the end of power-down for an ICP dry-etch cleaning chamber by introducing oxygen gas with specified pressure and power level for each of the six steps of the power-down procedure.

(7) Grouping of Claims

The appellant's statement in the brief that claims 1-15 stands or fall together.

It is noted that claims 16-22 are indicated allowable.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,221,425	BLANCHARD et al	6-1993

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim 1- 3 and 5-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Blanchard et al (USP 5,221,425).

Blanchard et al disclose a method for reducing the foreign particles during a reactive ion etching process by gradually reducing the radio frequency (RF) voltage to a minimum voltage in a series of steps (col.2, lines 19-40 and 60-68).

Blanchard et al also disclose that gradually reducing the RF voltage to zero results in the least amount of foreign matter onto the substrate and the reduction of the power is done by incrementally reducing the power in a series of steps, wherein at least five steps are used to reduce the power to test five groups of substrates for measuring the content of the foreign particles (col.5, lines 34-43 and lines 64-col.6, lines 2).

Blanchard et al further, disclose that the plasma gases can be removed from the chamber by means of a vacuum pump (col.4, lines 48-51).

Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard et al (USP 5,221,425).

Blanchard et al discussed in the above paragraph but Blanchard et al do not disclose that the reactive ion etch (RIE) chamber could be inductive coupled plasma (ICP) dry-etch chamber.

Blanchard et al's method includes gradually reducing the RF voltage applied to the cathode. So, it would have been obvious to one skill in the art to use ICP dry-etch chamber because it would provide the same benefit.

(11) Response to Argument

Applicants argue that Blanchard et al differs from the instant application on the ground that Blanchard et al teach a method for reducing foreign matter deposited on a substrate during reactive ion etching, whereas, the instant application disclose a method of reducing dry- etch chamber particle count at the end of power-down for a dry-etch chamber.

This is not persuasive because Blanchard et al disclose a process for reducing foreign particles on a substrate to be processed, wherein the power is down to zero in such a manner that particle count is reduced at the end of the power-down process.

Blanchard et al, further disclose that the power down procedure starts after the etching process (col.5, lines 54-col.6, lines 2).

So, Blanchard et al inherently teach that the particle count is reduced in the dry-etch chamber because the substrate is positioned in the chamber.

Examiner also states that foreign particles will deposit on both the substrate and the dry-etch chamber during RIE process because the substrate is within the chamber

during the etching process and the power-down procedure starts after the etching process.

As a result, the foreign particles are reduced on the surface on the substrate and at the same time the dry- etch chamber also have reduced foreign particle count because the substrate is processed on the chamber.

Applicants also argue that Blanchard et al do not teach the power-down is performed in a controlled and gradual manner, which is not persuasive because Blanchard et al teach that the reduction of the power is performed in a controlled and gradual manner (col.5, lines 64-col.6, lines 2).

Blanchard et al also teach that the particles count reduces at the end of the power-down procedure (col.6, lines 32-40).

In conclusion, examiner states that Blanchard et al disclose a similar process to reduce particle count on the surface of a substrate as well as the dry-etch chamber using a power-down procedure in such a manner that the power or the voltage is gradually reduced to a minimum value, wherein the power-down procedure is a subsequent process of the RIE processing (see claims 1-4).

For the above reasons, it is believed that the rejection to claims 1-15 should be sustained.

Respectfully submitted,

Shamim Ahmed
Patent Examiner
Art Unit 1765

SA
March 6, 2003

Conferees
Glen Caldarola

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Benjamin Utech

GEORGE O SAILE
20 MCINTOSH DRIVE
POUGHKEEPSIE, NY 12603

Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700